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(71)Applicant : SEED CO LTD

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## (54) HYDROPHILIC LENS FOR EYE AND ITS PRODUCTION

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a contact lens having good fitting feeling and without lowering the wettability even when the lens is used for a long time by graft- polymerizing a specified hydrophilic compd. to the surface of the lens for eyes by using water-soluble peroxide as a catalyst. SOLUTION: A lens for eyes is immersed in a hydrophilic compd. soln. containing water-soluble peroxide to carry out graft polymn. As for a hydrophilic graft monomer, polyethyleneglycol mono (meth)acrylate, polypropylenglycol mono(meth)acrylate or glycerol mono(meth)acrylate are used. An 0.01 to 90 wt.% aq. soln. of these hydrophilic graft monomers is prepared and the lens for eyes is immersed in the aq. soln. to carry out graft polymn. At the time of the graft polymn., water-soluble peroxide is used as a graft polymn. initiator. As for the water-soluble peroxide to be used as a concrete example, ammonium persulfate, potassium persulfate, sodium persulfate and peroxy-potassium sulfate can be used.

## LEGAL STATUS

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CLAIMS

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[Claim(s)]

[Claim 1] The manufacture approach of the hydrophilic ophthalmic lens characterized by being immersed into the hydrophilic compound solution containing a water-soluble peroxide, and carrying out the graft polymerization of the ophthalmic lens.

[Claim 2] The manufacture approach of the hydrophilic ophthalmic lens according to claim 1 characterized by said hydrophilic compound being polyethylene-glycol monochrome (meta) acrylate, polypropylene-glycol monochrome (meta) acrylate, or glycerol monochrome (meta) acrylate.

[Claim 3] The hydrophilic ophthalmic lens characterized by being obtained by the manufacture approach of a hydrophilic ophthalmic lens according to claim 1 or 2.

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a hydrophilic ophthalmic lens and its manufacture approach. Furthermore, if it states in detail, a hydrophilic ophthalmic lens will be simply manufactured by carrying out the graft polymerization of the hydrophilic compound to ophthalmic lens front faces, such as a contact lens and an intraocular implant.

[0002]

[Description of the Prior Art] The contact lens by which current marketing is carried out is divided roughly into two sorts, an elasticity contact lens and a hard contact lens, from the description.

[0003] Among these, compared with the elasticity contact lens, a hard contact lens has simple handling, and the eyesight straightening effect is also excellent, and it is used widely. However, the hard contact lens which used the polymethylmethacrylate from the former etc. is inferior in a feeling of wearing compared with an elasticity contact lens, and since the amount of oxygen transparency is small, the burden to a cornea is also large [ a contact lens ].

[0004] Then, many oxygen permeability hard contact lenses which used as the principal component the acrylate which has siloxane association (meta) as a hard contact lens which raised a feeling of wearing further, and lenses which raised resistance to contamination using fluorine content (meta) acrylate are developed. However, the contact lens which made these the principal component has the strong hydrophobicity of a material, and in order to improve this, various surface treatment is performed.

[0005] For example, hydrophilic approaches, such as hydrophilization by plasma, such as oxygen gas, inert gas, and hydrocarbon gas, such as hydrophilization processing on the front face of a base material by UV irradiation (JP,9-77535,A), a silane coupling agent, acid-alkali treatment, UV irradiation, and radiation irradiation, are reported using the hydrophilization processing (\*\*\*\*\* No. 501705 [ nine to ] official report) and the photocatalyst by the operation gas which contains a hydrogen peroxide and an organic compound by the plasma state.

[0006]

[Problem(s) to be Solved by the Invention] In said contact lens hydrophilic approach, although the water wettability immediately after processing is good, if it carries out long duration progress or a contact lens is rubbed, washed and carried out, the water wettability will deteriorate. If a contact lens is worn, adhesion of dirt, such as a lipid in tear fluid and protein, must not be avoided, must be rubbed and washed in a contact lens front face, or must perform chemical washing by the enzyme, a hydrogen peroxide, etc. on it. Furthermore, the hydrophilic approach with which the average duration of service of a contact lens is about one year in a hard lens, and can bear these wearing cycles enough in two - three years and a soft contact lens was unprecedented.

[0007] Moreover, although the graft polymerization by plasma exposure was performed and the hydrophilization approach on the front face of a contact lens was also proposed conventionally, since this was what carries out graft polymerization using the peroxide which exposed the contact lens after plasma treatment into air, and was generated, the graft of the hydrophilic monomer was not carried out to homogeneity on a contact lens front face, and it had the case where the graft of sufficient quantity of the hydrophilic monomer was not carried out to a contact lens front face.

[0008] When the stain resistance to a contact lens is influenced from the condition on the front face of a contact lens, and it is in the inclination for protein to become it easy to adhere that a contact lens front face is generally ionicity, on the other hand and a front face is in a hydrophobic, strong condition, it is in the inclination for a

lipid to become easy to adhere. Therefore, in order to solve these many problems, to process the high monomer of nonionic and a hydrophilic property on a contact lens front face is desired.

[0009] The technical problem of this invention is that offer the manufacture approach of the ophthalmic lens by the hydrophilic approach which can bear a prolonged wearing cycle enough, and resistance to contamination is good and offers an ophthalmic lens with a good feeling of wearing.

[0010]

[Means for Solving the Problem] In this invention, in order to solve a technical problem, the hydrophilic ophthalmic lens characterized by being obtained by the manufacture approach of the hydrophilic ophthalmic lens characterized by being immersed into the hydrophilic compound solution containing a water-soluble peroxide, and carrying out the graft polymerization of the ophthalmic lens and this manufacture approach is offered.

[0011]

[Embodiment of the Invention] In this invention, polyethylene-glycol monochrome (meta) acrylate, \*\* polypropylene-glycol monochrome (meta) acrylate, or glycerol monochrome (meta) acrylate is used as a hydrophilic graft monomer.

[0012] These hydrophilic-properties graft monomer is nonionic, and its hydrophilic property is also high. Therefore, if the coat of these monomers is carried out to an ophthalmic lens front face, though wettability is good, the ophthalmic lens to which dirt cannot adhere easily, either can be offered. Furthermore, biocompatibility is known for the high thing and ethylene glycol and propylene glycol can offer a safe ophthalmic lens.

[0013] The 0.01 - 90-% of the weight water solution of these hydrophilic-properties graft monomer is prepared, an ophthalmic lens is immersed in this water solution, and graft polymerization is performed.

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TECHNICAL FIELD

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PRIOR ART

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TECHNICAL PROBLEM

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MEANS

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